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LINKING OVER CONES AND NONTRIVIAL SOLUTIONS FOR p-LAPLACE EQUATIONS WITH p-SUPERLINEAR NONLINEARITY

MARCO DEGIOVANNI AND SERGIO LANCELOTTI

ABSTRACT. We prove that the quasilinear equation $-\Delta_p u = \lambda V|u|^{p-2}u + g(x,u)$, with g subcritical and p-superlinear at 0 and at infinity, admits a nontrivial weak solution $u \in W_0^{1,p}(\Omega)$ for any $\lambda \in \mathbb{R}$. A minimax approach, allowing also an estimate of the corresponding critical level, is used. New linking structures, associated to certain variational eigenvalues of $-\Delta_p u = \lambda V|u|^{p-2}u$, are recognized, even in absence of any direct sum decomposition of $W_0^{1,p}(\Omega)$ related to the eigenvalue itself.